

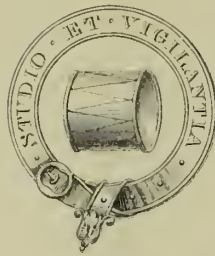


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*Dr. Günther, M.R.S. &c.*

*from his friend,  
the Author.*

MONOGRAPH  
ON  
THE FOSSIL REPTILIA  
OF THE  
LONDON CLAY.

VOLUME II. PART I.

PAGES 1—4; PLATES I AND II.

[CHELONE GIGAS.]

BY  
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ETC. ETC.

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ON THE  
FOSSIL REPTILIA OF THE LONDON CLAY.  
VOL. II.

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RESTORATION OF *CHELONE GIGAS*, Ow., A SPECIES INDICATED BY A  
FRAGMENT OF THE FEMUR IN A FORMER MONOGRAPH.<sup>1</sup>

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IN the 'Monograph on the Fossil Reptilia of the London Clay, Supplement to the Order Chelonia,'<sup>1</sup> the proximal end of the femur of a very large marine Chelonian is noticed and figured in Pl. XXIX, fig. 5, and the size of the species in proportion to the largest known existing Turtle, an individual of *Chelone mydas*, which weighed 150 lbs., is illustrated by a subjoined figure of the entire femur of that individual (fig. 5'). The breadth of the proximal end of this femur across the trochanters is barely two inches, the same dimension of the fossil is four inches ten lines.

In 1858 the British Museum obtained the upper portion of the cranium of a *Chelone* from the same formation and locality (Sheppey), corresponding in magnitude with the above-cited portion of fossil femur, and it was registered and labelled as of the *Chelone gigas*.<sup>2</sup>

In the present year, 1879, W. H. SHRUBSOLE, Esq., F.G.S., submitted to my examination an almost entire cranium and other portions of the skeleton of the same gigantic species of Turtle, which had been exhumed from the septarian modification of the London Clay at Sheppey. The following are dimensions of the fossil (Pl. I) and of the largest cranium of *Chelone mydas* in the Zoological Department of the British Museum.

<sup>1</sup> Palæontographical Society's Volume, issued for the year 1849, 4to., Pl. XXIX, fig. 5, 1850.

<sup>2</sup> 'Palæontology,' 8vo., 2nd ed., 1861, p. 317.

	<i>Chelone gigas.</i>		<i>Chelone mydas.</i>	
	inches.	lines.	inches.	lines.
Length . . . . .	18 <sup>1</sup>	0	10	0
Breadth . . . . .	14 <sup>2</sup>	6	7	0
Breadth across outside of tympanic articular end	13	6	6	3
Antero-posterior extent of outlet of orbit . . . . .	5	3	2	5
Vertical extent of outlet of orbit . . . . .	3	9	2	7
Height of nostril . . . . .	2	10	1	1
Breadth of nostril . . . . .	4	0	1	5

Notwithstanding an obvious flattening vertically with some distortion I incline to regard the skull of *Chelone gigas* as of relatively less vertical extent than that of *Chelone mydas*. The orbit is relatively larger and is longer in proportion to its vertical diameter. The slight downward extension of the upper border is near the fore part of the cavity in *Chelone gigas*, near the hind part in *Chelone mydas*. The nostril in *Chelone gigas* is broader in proportion to its depth, more especially towards its base.

The subtrenchant alveolar border of the maxillary is continued from beneath the orbit in an uninterrupted feebly convex line to the premaxillaries. There is no indication of the abrupt angular notch which produces the tooth-like process of the maxillary anterior to the orbit in *Sphargis*.

So far as the sutures can be traced on the upper expanse of the cranium (Plate I) they conform in the main with those of *Chelone mydas*.

The vaulted cavities roofed over by the parietals and mastoids are relatively lower and smaller in *Chelone gigas* than in *Chel. mydas*, and this irrespective of the degree of pressure which has somewhat affected the shape of the hinder outlets.

The superoccipital spine seems from the size of its broken base to have had the same relative degree of production beyond the foramen magnum in the gigantic fossil as in the recent Turtle.

The bilamellar base of the superoccipital element forming the keystone of the arch of the myelonal outlet has been slightly dislocated and pressed downward into the foramen magnum; but the exoccipitals retain their natural position as the side walls of that orifice. The part of the 'foramen magnum' (Pl. II, fig. 1) contributed by the basioccipital is less prominent, more extensively concave, than in *Chelone mydas*, in which such concavity is represented by a central pit. The whole condyle is broader in proportion to its depth, and the basioccipital tract anterior to the condyle is relatively broader than in *Chel. mydas*.

So much as could be exposed by the mason's chisel of the palatal surface of the enormous cranium (Pl. II, fig. 3) accorded in the main with the configuration of the

<sup>1</sup> Part of the superoccipital spine has been broken away.

<sup>2</sup> Slightly increased by posthumous flattening.

same surface in existing Turtles. From the end of the occipital condyle to the posterior border of the *palatonaris* the extent is nine inches in *Chelone gigas*. The palatal opening is, as in *Sphargis*, more distinctly divided or indicative of the two nasal passages than in *Chelone mydas*.

The least breadth of the suturally united pterygoids dividing the lower temporal openings is two inches ten lines; in *Chel. mydas* it is one inch five lines.

The less perfect skull of *Chelone gigas* obtained in 1858 is represented chiefly by the upper wall, to the outer surface of which is cemented portions of the scapulo-coracoid arch. On clearing out the matrix from the inner or under surface of this specimen parts of the side walls of the cerebral cavity and of the orbits, with the alveolar border of the upper jaw, two inches and a half in advance of the orbit, were brought into view. The comparable parts confirm the affinity to the true Turtles, *Chelone*, as contrasted with the "leatherbacks" (*Sphargis*).

The extreme breadth of this cranium is	.	.	13 inches.
The preserved length	.	.	15 „
The extreme breadth of the cerebral chamber	.	.	2 „

The portion of the alveolar border testifies, as in the better preserved specimen, to the Chelonial character.

The decisive test of the affinities of the Eocene gigantic representative of the marine family of the Order *Chelonia* is afforded by the portion of the petrified carapace and plastron associated with the later discovered skull. The Leatherback Turtles (*Sphargis*) have little of the carapace besides the normal unexpanded pleurapophyses (dorsal ribs) to undergo the conservative petrifying process.

The expanded horizontal plates from the summits of the neural spines and the corresponding expansions from the upper surface of the pleurapophyses, constituting the so-called neural and costal plates, have been preserved in eight portions of those modified segments of the carapace of *Chelone gigas* which have been recovered.

The neural plate answering to the 'sixth' of the entire carapace measures four inches in length and eight inches in breadth; the lateral halves slope with a feeble concavity from a slightly elevated medial rising as in the hinder plates of *Chelone subcristata*.<sup>1</sup> The costal sutural border makes a very low angle at about the same distance from the anterior border as in the corresponding plate of *Chelone longiceps*.<sup>2</sup> The marginal thickness of the plate is nine lines. The neural plates are relatively broader in proportion to their length than in any recent or hitherto observed fossil species of *Chelone*.

About one inch of the first neural plate and three inches of the seventh are preserved

<sup>1</sup> 'Monograph on the Fossil Reptilia of the London Clay,' Part I, *Chelonia*, issued by the Palæontographical Society, for the year 1848, p. 24, Pl. VIII, fig. 1, 1849.

<sup>2</sup> *Ib.*, *ib.*, p. 16, Pl. IV, fig. 2, s 6.

in connection with the intervening neural plates, which are entire save some abrasion of the outer surface of the hinder ones and slight mutilation of the sutural borders.

The costal plates, of which the proximal parts of four are preserved on the right side, have been slightly dislocated from their marginal sutures with the neural plates by superincumbent pressure. A longitudinal extent of eight and a half inches is preserved of the left sixth costal plate.

On the under part of the mass of petrified clay to which the above-described portion of carapace is cemented the expanded sternal portions of the pair of coracoid bones are preserved converging to the median line; a portion of the xiphoid production of the entosternum extends along the medial line in advance of the broad ends of the converging coracoids. This is the chief recognisable part of the plastron here preserved, but it adds to the testimony against the *Sphargis* affinity, in which genus the entosternal does not send backward such xiphoid process.

The breadth of the sternal end of the coracoid of *Chelone gigas* is six inches; that of the scapular end shown in another portion of the matrix is two inches and a half; the total length of the coracoid is one foot five inches.



PLATE I.

*Chelone gigas*, natural size.

Upper view of the skull.

From the London Clay, Isle of Sheppey. In the Collection of W. H. Shrubsole Esq., F.G.S., of Sheerness-on-Sea.











PLATE II.

*Chelone gigas*, one third natural size.

FIG.

1. Side view of the skull.
2. Under surface of the skull.
3. Back view of the cranium.

From the London Clay, Isle of Sheppey. In the Collection of W. H. Shrubsole, Esq., F.G.S., of Sheerness-on-Sea.

